DELTA ELECTRONICS, INC.
台達電子工業股份有限公司
333
桃園縣龜山工業區興邦路31-1號
TEL:886-3-361-6301
FAX:886-3-362-7267

www.delta.com.tw/industrialautomation

IABU Headquarters
Delta Electronics, Inc.
Taoyuan1
31-1, Xingbang Road, Guishan Industrial Zone,
Taoyuan County 33370, Taiwan, R.O.C.
TEL: 886-3-362-6301 / FAX: 886-3-362-7267

ASIA
Delta Electronics (Jiang Su) Ltd.
Wujiang Plant3
1688 Jiangxing East Road,
Wujiang Economy Development Zone,
Wujiang City, Jiang Su Province,
People's Republic of China (Post code: 215200)
TEL: 86-512-6340-3008 / FAX: 86-512-6340-7290

Delta Greentech (China) Co., Ltd.
238 Min-Xia Road, Cao-Lu Industry Zone,Pudong, Shanghai,
People's Republic of China
Post code : 201209
TEL: 021-58635678 / FAX: 021-58630003

Delta Electronics (Japan), Inc.
Tokyo Office
Delta Shibadaimon Building, 2-1-14
Shibadaimon, Minato-Ku, Tokyo, 105-0012,
Japan
TEL: 81-3-5733-1111 / FAX: 81-3-5733-1211

Delta Electronics (Korea), Inc.
234-9, Duck Soo Building 7F, Nonhyun-Dong,
Kangnam-Gu, Seoul, Korea 135-010
TEL: 82-2-515-5305 / FAX: 82-2-515-5302

Delta Electronics (Singapore) Pte. Ltd.
8 Kaki Bukit Road 2, #04-18 Ruby Warehouse Complex,
Singapore 417841
TEL: 65-6747-5155 / FAX: 65-6744-9228

Delta Power Solutions (India) Pte. Ltd.
Plot No. 28, Sector-34, EHTP
Gurgaon-122001 Haryana, India
TEL: 91-124-416-9040 / FAX: 91-124-403-6045

AMERICA
Delta Products Corporation (USA)
Raleigh Office
P.O. Box 12173,5101 Davis Drive,
Research Triangle Park, NC 27709, U.S.A.
TEL: 1-919-767-3813 / FAX: 1-919-767-3969

DELTA PRODUCTS CORPORATION BRAZIL
São Paulo Office
Rua Itapeva N° 26, 3° andar, Bela Vista
Edificio Itapeva One
CEP: 01332-000-São Paulo-SP-Brazil
TEL : 55-11-3568-3875 / FAX: 55-11-3568-3865
www.delta-americas.com.br

EUROPE
Deltronics (The Netherlands) B.V.
Eindhoven Office
De Witbogt 15, 5652 AG Eindhoven, The Netherlands
TEL: 31-40-2592850 / FAX: 31-40-2592851

TURKEY
F.A.S.T.Fabrika Aygitlari Sistem Teknolojisi
FAST Plaza, Karaman Çiftlik Yolu No : 51
Kücükbakkalköy / Kadiköy /'ISTANBUL
TEL: 90 216 574 94 34 / FAX: 90 216 574 16 60
http://www.fastltd.net E-Mail:Satis@fastltd.net

中达电通
中达电通股份有限公司

上海市浦东新区民夏路238号, 201209

公司网址 : www.deltagreentech.com.cn

北京 : 010-8225-3225
太原 : 0351-4039-485
长春 : 0431-8859-6017
长沙 : 0731-2941-117
成都 : 028-8434-2072
重庆 : 023-6310-3325
广州 : 020-3879-2175
哈尔滨 : 0451-5366-5570
杭州 : 0571-8882-0610
合肥 : 0551-2816-777
济南 : 0531-8690-7277
南昌 : 0791-6255-010
南京 : 025-8334-6585
上海 : 021-6301-2827
沈阳 : 024-2334-1159
武汉 : 027-8544-8265
西安 : 029-8836-0640
厦门 : 0592-5313-601
郑州 : 0371-6384-2772

* We reserve the right to change the information in this manual without prior notice
* 規格若有變更，以實際產品爲主
* 规格若有变更，以实际产品为主

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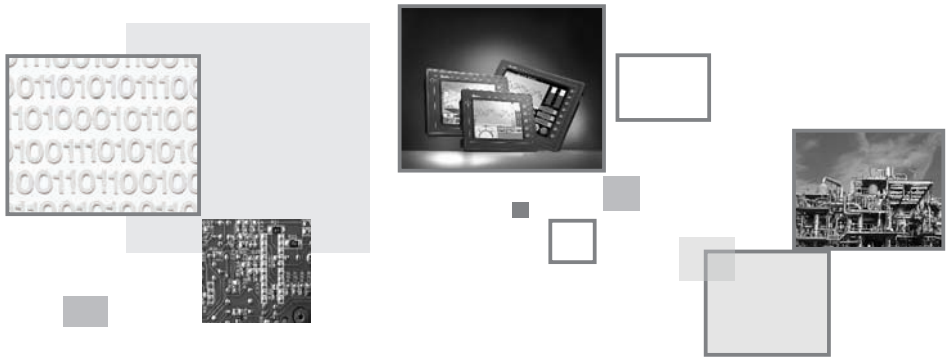
DELTA ELECTRONICS, INC.



DOP-A

QUICK START
KULLANIM KILAVUZU
安裝手冊 / 安装手册

- ***Man-machine/High Reliability/ User-friendly HMI Products***
- ***Makine Dostu / Güvenilir / Kullanımı Kolay HMI Ürünleri***
- ***人性化/高可靠度/友善人機介面***
- ***人性化/高可靠度/友善人机界面***

www.delta.com.tw/industrialautomation

Preface

Thank you for purchasing DELTA's DOP-A, AE and AS series. This quick start will be helpful in the installation, wiring and inspection of Delta HMI. Before using the product, please read this quick start to ensure correct use. You should thoroughly understand all safety precautions before proceeding with the installation, wiring and operation. Place this quick start in a safe location for future reference. Please observe the following precautions:

- Install the product in a clean and dry location free from corrosive and inflammable gases or liquids.
- Ensure that all wiring instructions and recommendations are followed.
- Ensure that HMI is correctly connected to a ground. The grounding method must comply with the electrical standard of the country.
- Do not modify or remove wiring when power is applied to HMI.
- Do not touch the power supply during operation. Otherwise, it may cause electric shock.
- For the information of HMI software operation, software installation and hardware wiring, please refer to the HMI software manual.

If you have any questions during operation, please contact our local distributors or Delta sales representative.

The content of this quick start may be revised without prior notice. Please consult our distributors or download the most updated version at http://www.delta.com.tw/industrialautomation.

Safety Precautions

Carefully note and observe the following safety precautions when receiving, inspecting, installing, operating, maintaining and troubleshooting. The following words, DANGER, WARNING and STOP are used to mark safety precautions when using the Delta's HMI product. Failure to observe these precautions may void the warranty!

Installation

- *Comply with quick start for installation. Otherwise it may cause equipment damage.*
- *Do not install the product in a location that is outside the stated specification for the HMI. Failure to observe this caution may result in electric shock, fire, or personal injury.*

Wiring

- *Connect the ground terminals to a class-3 ground (Ground resistance should not exceed 100Ω). Improper grounding may result in communication error, electric shock or fire.*

Operation

- *The users should use Delta Screen Editor software to perform editing in Delta's HMI product. To perform editing and confirming HMI programs without using Delta Screen Editor software in Delta's HMI product may result in abnormal operation.*

- *Do not modify wiring during operation. Otherwise it may result in electric shock or personal injury.*
- *Never use a hard or pointed object to hit or strike the screen as doing this may damage the screen and let the screen has not respond at all, and then cause HMI to work abnormally..*

Maintenance and Inspection

- *Do not touch any internal or exposed parts of the HMI as electrical shock may result.*
- *Do not remove operation panel while power is on. Otherwise electrical shock may result.*
- *Wait at least 10 minutes after power has been removed before touching any HMI terminals or performing any wiring and/or inspection as an electrical charge may still remain in the HMI with hazardous voltages even after power has been removed.*
- *Turn the power off before changing backup battery and check system settings after finishing change. (all data will be cleared after changing battery).*
- *Be sure the ventilation holes are not obstructed during operation. Otherwise malfunction may result due to bad ventilation or overheating troubles.*

Wiring Method

- *Remove the terminal block from the HMI before wiring.*
- *Insert only one wire into one terminal on the terminal block.*
- *If the wiring is in error, perform the wiring again with proper tools. Never use force to remove the terminals or wires. Otherwise, it may result in malfunction or damage.*
- *For the power line that forced to take out, ensure to check wiring again and restart.*

Communication Wiring

- *Comply with communication wiring specification for wiring.*
- *Wiring length should comply with the stated specification for the HMI.*
- *Proper grounding to avoid bad communication quality.*

Installation and Storage Conditions

The product should be kept in the shipping carton before installation. In order to retain the warranty coverage, the HMI should be stored properly when it is not to be used for an extended period of time. Some storage suggestions are:

- Store in a clean and dry location free from direct sunlight.
- Store within an ambient temperature range of -20°C to +60°C (-4°F to 140°F).
- Store within a relative humidity range of 10% to 90% and non-condensing.
- Do not store the HMI in a place subjected to corrosive gases and liquids.
- Correctly packaged and placed on a solid and durable surface.
- Do not mount the HMI adjacent to heat-radiating elements or in direct sunlight.
- Do not mount the HMI in a location subjected to corrosive gases, liquids, or airborne dust or metallic particles.
- Do not mount the HMI in a location where temperatures and humidity will exceed specification.
- Do not mount the HMI in a location where vibration and shock will exceed specification.
- Do not mount the HMI in a location where it will be subjected to high levels of electromagnetic radiation.

Installation

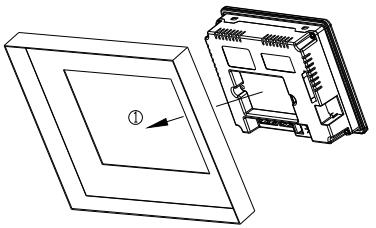
Installation Note:

- Improper installation will result in malfunction and greatly reduce the life of the HMI. Be sure to follow the guidelines in this quick start when installing the HMI.
- In order to ensure the HMI being well ventilated, make sure that the ventilation holes are not obstructed and must provide sufficient free space around HMI.
- For use on a flat surface of a Type 4X "Indoor Use Only" enclosure or equivalent.

Installation Method [A and AE Series]:

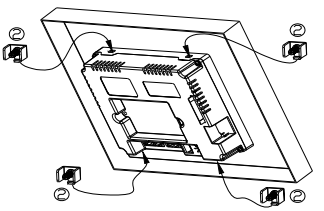
Step 1:

Ensure to put waterproof gasket into HMI and then insert the HMI into the panel cutout.



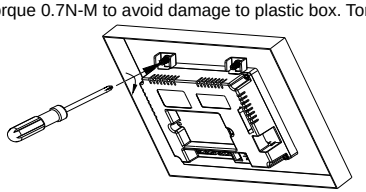
Step 2:

Ensure to insert fasteners into the HMI's insertion slots and turn the screw till screws touch panel cutout.



Step 3:

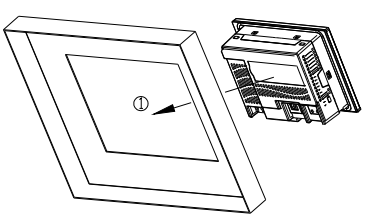
Turn the screw with less than torque 0.7N-M to avoid damage to plastic box. Torque: 6.17lb-inch(0.7N-M)



Installation Method [AS Series]:

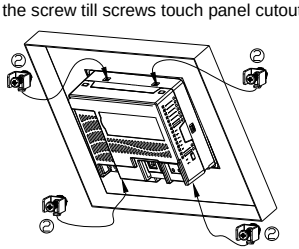
Step 1:

Ensure to put waterproof gasket into HMI and then insert the HMI into the panel cutout.



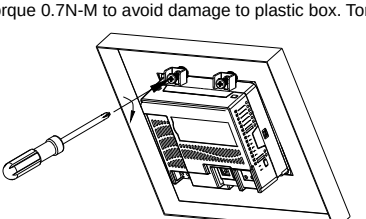
Step 2:

Ensure to insert fasteners into the HMI's insertion slots and turn the screw till screws touch panel cutout.



Step 3:

Turn the screw with less than torque 0.7N-M to avoid damage to plastic box. Torque: 6.17lb-inch(0.7N-M)



Power Line Installation

The specifications for power terminal wiring are shown in the table below:

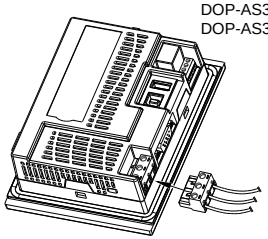
Type	Wire Gauge (AWG)	Stripped length	Torque
Solid	28~12	7~8 mm	5 kg-cm (4.3 lb-in)
Stranded	28~12	7~8 mm	5 kg-cm (4.3 lb-in)

The specifications for communication terminal wiring are shown in the table below (AS Series only):

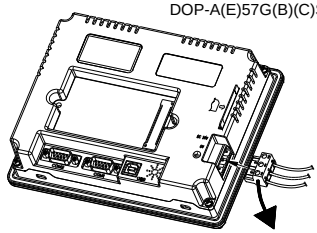
Type	Wire Gauge (AWG)	Stripped length	Torque
Solid	30 ~ 16	5 ~ 6 mm	2 kg-cm (1.7 lb-in)
Stranded	30 ~ 16	5 ~ 6 mm	2 kg-cm (1.7 lb-in)

Be sure to plug power line into HMI according to following arrow direction.

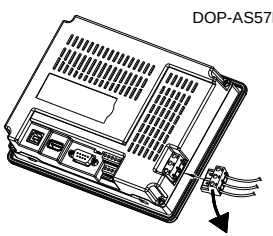
DOP-AS35THTD
DOP-AS38BSTD



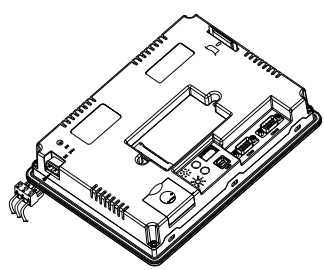
DOP-A(E)57G(B)(C)STD



DOP-AS57BSTD



DOP-A80THTD1
DOP-AE80THTD
DOP-A(E)10THTD1



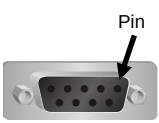
Basic Inspection

Item	Content
General Inspection	■ Periodically inspect the screws of the connection between the HMI and device. Tighten screws as necessary as they may loosen due to vibration and varying temperatures. ■ Ensure that oil, water, metallic particles or any foreign objects do not fall inside the HMI, control panel or ventilation slots and holes. As these will cause damage. ■ Ensure the correct installation and the control panel. It should be free from airborne dust, harmful gases or liquids.

Item	Content
Inspection before operation (power is not applied)	■ Ensure that all wiring terminals are correctly insulated. ■ Ensure that all wiring is correct or damage and or malfunction may result. ■ Visually check to ensure that there are not any unused screws, metal strips, any conductive or inflammable materials inside HMI. ■ Ensure to lower electromagnetic interference when devices are influenced by it. ■ Ensure that the external applied voltage to HMI is correct and matched to the controller.
Inspection before operation (power is applied)	■ Check if power LED lights. ■ Check if the communication among devices is normal. ■ Please contact our local distributors or Delta sales representative if there are any abnormal conditions.

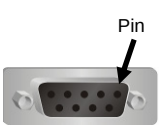
Pin Definition of Serial Communication

COM1 Port [A, AE and AS57BSTD Series]

COM Port	PIN	Contact
		RS-232
	1	
	2	RXD
	3	TXD
	4	
	5	GND
	6	
	7	RTS
	8	CTS
	9	

Note: Blank = No Connection.

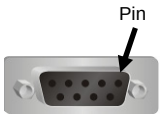
COM2 Port [A Series]

COM Port	PIN	MODE1	MODE2	MODE3
		RS-232	RS-422	RS-485
	1		RXD-	D-
	2	RXD	RXD+	D+
	3	TXD	TXD+	D+
	4		TXD-	D-
	5	GND		
	6		RTS-	
	7	RTS	RTS+	
	8	CTS	CTS+	
	9		CTS-	

Note 1: Blank = No Connection.

Note 2: When selecting Mode3 (for RS-485), D+ indicates that PIN 2 and PIN 3 is connected, and D- indicates that PIN 1 and PIN 4 is connected.

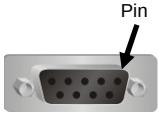
COM2 and COM3 Port [AE, A80THTD1 and A10THTD1 Series]

COM Port		PIN	MODE1	MODE2	MODE3	MODE4	MODE5	MODE6
			RS-232	RS-422	RS-485	RS-232*2	RS-422*2	RS-485*2
	COM2	1		RXD-	D-		RXD1-	D1-
		2	RXD	RXD+	D+	RXD1	RXD1+	D1+
		3	TXD	TXD+	D+	TXD1	TXD1+	D1+
		4		TXD-	D-		TXD1-	D1-
		5	GND					
	COM3	6		RTS-			TXD2-	D2-
		7	RTS	RTS+		TXD2	TXD2+	D2+
		8	CTS	CTS+		RXD2	RXD2+	D2+
		9		CTS-			RXD2-	D2-

Note 1: Blank = No Connection.

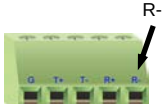
Note 2: When selecting Mode3 (for RS-485), D+ indicates that PIN 2 and PIN 3 is connected, and D- indicates that PIN 1 and PIN 4 is connected. When selecting Mode6 (for RS-485), D1+ indicates that PIN 2 and PIN 3 is connected, D1- indicates that PIN 1 and PIN 4 is connected, D2+ indicates that PIN 7 and PIN 8 is connected, and D2- indicates that PIN 6 and PIN 9 is connected.

COM1 and COM3 [AS38BSTD, AS35THTD Series]

COM Port		PIN	MODE1	MODE2
			RS-232	RS-232*2
	COM1	1		
		2	RXD	RXD1
		3	TXD	TXD1
		4		
		5	GND	
	COM3	6		
		7	RTS	TXD2
		8	CTS	RXD2
		9		

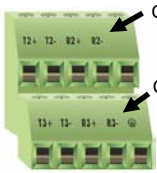
Note: Blank = No Connection.

COM2 Port [AS38BSTD, AS35THTD Series]

COM Port	PIN	MODE1	MODE2
		RS-422	RS-485
	R-	RXD-	D-
	R+	RXD+	D+
	T-	TXD-	D-
	T+	TXD+	D+
	G	GND	

Note 1: When selecting Mode2 (for RS-485), D+ indicates that R+ and T+ is connected, and D- indicates that R- and T- is connected.

COM2 and COM3 Port [AS57BSTD Series]

COM Port		PIN	MODE1	MODE2	MODE3
			RS-485*2	RS-422*2	RS-422
	COM2	R-	D-	RXD-	RXD-
		R+	D+	RXD+	RXD+
		T-		TXD-	TXD-
		T+		TXD+	TXD+
		G	GND		
	COM3	R-	D-	RXD-	CTS-
		R+	D+	RXD+	CTS+
		T-		TXD-	RTS-
		T+		TXD+	RTS+

Note 1: Blank = No Connection.

Note 2: When using RS-422 flow control, please refer to the COM3 Port signals table above for pin assignments. At this time, COM2 and COM3 ports cannot be used individually.

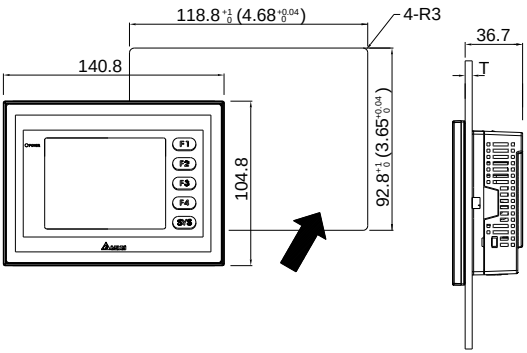
Comparison of Flow Control Protocols

COM Port	DOP-AE Series	DOP-A Series	DOP-AS57 Series	DOP-AS35 / AS38 Series
COM1	RS-232 flow control supported	RS-232 flow control supported	RS-232 flow control supported	RS-232 flow control supported. But, when RS-232 flow control function is enabled, COM3 can not be used.
COM2	RS-422 flow control supported. But, when RS-422 flow control function is enabled, COM3 can not be used.	RS-422 flow control supported	RS-422 flow control supported. But, when RS-422 flow control function is enabled, COM3 can not be used.	RS-422 flow control is not supported.
COM3		N/A		RS-232 flow control supported. But, when RS-232 flow control function is enabled, COM3 can not be used.

Note: For more detailed information regarding the pin definition for flow control, please refer to the pin definition of serial communication of each series.

Dimensions

DOP-AS35THTD / DOP-AS38BSTD

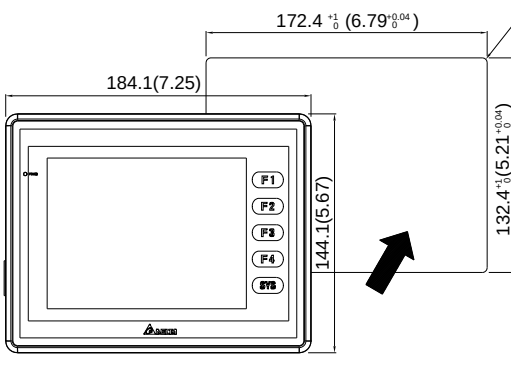


NOTE:

T=1.6mm(0.06in) ~ 3.0mm(0.12in)

Units: mm

DOP-AS57BSTD

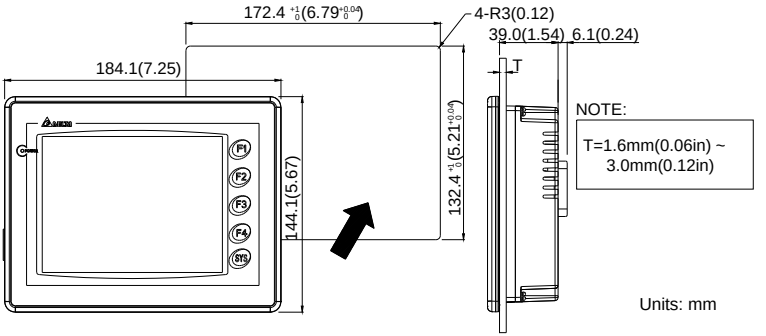


NOTE:

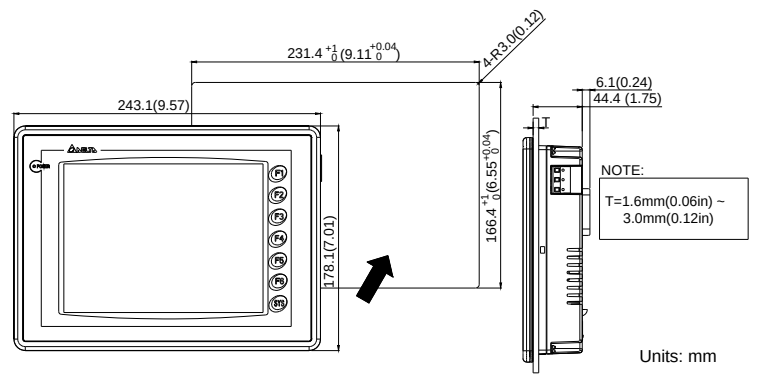
T=0.06in(1.6mm) ~ 0.12in(3.0mm)

Units: mm

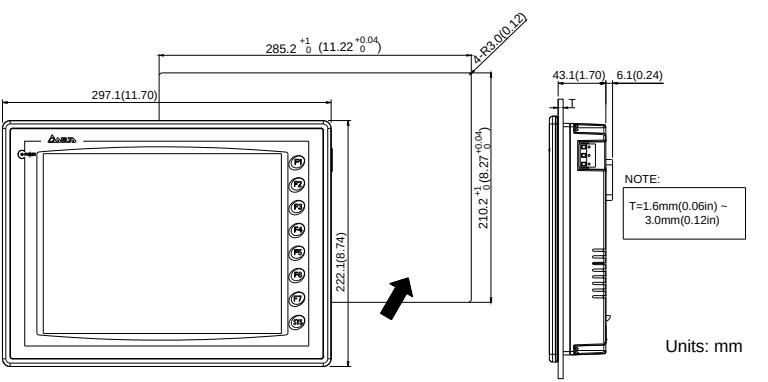
DOP-A(E)57G(B)(C)STD



DOP-A80THTD1 / DOP-AE80THTD



DOP-A(E)10THTD1



Specifications

MODEL		AS35THTD	AS38BSTD	AS57B(C)STD	A(E)57BSTD	A(E)57GSTD
LCD MODULE	Display Type	3.5” TFT LCD (65536 colors)	3.8” STN LCD (8 shades of blue)	5.7” STN LCD (8 shades of blue)	5.7” STN LCD (8 shades of blue)	5.7” FSTN LCD (16 shades of gray)
	Resolution	320 x 240 pixels				
	Back Light	LED Back Light (less than 30,000 hours half-life at 25°C) (Note 1)	LED Back Light (less than 10,000 hours half-life at 25°C) (Note 1)	CCFL Back Light (less than 50,000 hours half-life at 25°C) (Note 1)		
	Display Size	70.08 x 52.56mm	76.8 x 57.6mm	115.17 x 86.37mm		
Operation System		Delta Real Time OS				
MCU		32-bit RISC Micro-controller				
Flash ROM		Flash ROM 2Mbytes	Flash ROM 1Mbytes		Flash ROM 2Mbytes	
SDRAM		8Mbytes	4Mbytes	16Mbytes	16Mbytes	16Mbytes
Backup Memory (Bytes)		128K	128K	128K	A: 256K AE: 512K	
EXT. Memory	SM Card				✓	✓
	USB Host (Ver 1.1)	✓	✓	✓		
Extension Interface					✓ (AE)	✓ (AE)
USB Client		1 USB Client Ver 1.1				
Serial COM Port	COM1	RS-232				
	COM2	RS-422 / RS-485			RS-232 / RS-422 / RS-485	
	COM3	RS-232		RS-422 / RS-485	RS-232 / RS-422 / RS-485 (AE)	
Function Key		User defined key x 4 + System key x 1				
Operation Voltage		DC +24V (-10% ~ +15%) (Please use isolated power supply) (Note 2)				
Backup Battery		3V lithium battery CR2032 x 1 / battery life: 5 years				
Buzzer		85dB				
Perpetual Calendar (RTC)		Built-in				
Cooling Method		Natural air circulation				
Safety Approval (Waterproof for front panel)		IP65 / NEMA4 / CE, UL				
Operation Temp.		0°C ~ 50°C				

MODEL	AS35THTD	AS38BSTD	AS57B(C)STD	A(E)57BSTD	A(E)57GSTD
Storage Temp.	-20°C ~ +60°C				
Ambient Humidity	10% ~ 90% RH [0 ~ 40°C], 10% ~ 55% RH [41 ~ 50°C] Pollution Degree 2				
Vibration Resistance	IEC 61131-2 Compliant 5Hz≦f＜9Hz = Continuous: 1.75mm / Occasional: 3.5mm 9Hz≦f≦150Hz = Continuous: 0.5g / Occasional: 1.0g X, Y, Z directions for 10 times				
Dimensions (W) x (H) x (D) mm	140.8 x 104.8 x 44.8		184.1 x 144.1 x 47		
Panel Cutout (W) x (H) mm	118.8 x 92.8		172.4 x 132.4		
Weight	Approx. 315g	Approx. 310g	Approx. 760g		

NOTE

1) The half-life of backlight is defined as original luminance being reduced by 50% when the maximum driving current is supplied to HMI. The life of LED backlight shown here is an estimated value under 25°C normal temperature and humidity conditions.
2) Users please use isolated power supply except DOP-A80THTD1, DOP-AE80THTD and DOP-A(E)10THTD1 these models.
3) Users can download the Screen Editor V1.05, the program editor of Delta HMI product and the user manual via the following link: http://www.delta.com.tw/industrialautomation/.
4) The content of this quick start may be revised without prior notice. Please consult our distributors or download the most updated version at http://www.delta.com.tw/industrialautomation/.

MODEL		A(E)57CSTD	A80THTD1 AE80THTD	A(E)10THTD1
LCD MODULE	Display Type	5.7” STN LCD (256 colors)	8” TFT LCD (65536 colors)	10.4” TFT LCD (65536 colors)
	Resolution	320 x 240 pixels	640 x 480 pixels	
	Back Light	CCFL Back Light (less than 50,000 hours half-life at 25°C) (Note 1)		CCFL Back Light (less than 30,000 hours half-life at 25°C) (Note 1)
	Display Size	115.17 x 86.37mm	162.2 x 121.7mm	211.2 x 158.4mm
Operation System		Delta Real Time OS		
MCU		32-bit RISC Micro-controller		
Flash ROM		Flash ROM 2Mbytes	Flash ROM 6Mbytes	
SDRAM		16Mbytes	32Mbytes	32Mbytes
Backup Memory (Bytes)		A: 256K AE: 512K	512K	512K
EXT. Memory	SM Card	✓	✓ (AE)	
	USB Host (Ver 1.1)		✓	✓
Extension Interface		✓ (AE)	✓ (AE)	✓ (AE)
USB Client		1 USB Client Ver 1.1		
Serial COM Port	COM1	RS-232		
	COM2	RS-232 / RS-422 / RS-485		
	COM3	RS-232 / RS-422 / RS-485 (AE)	RS-232 / RS-422 / RS-485	
Function Key		User defined key x 4 + System key x 1	User defined key x 6 + System key x 1	User defined key x 7 + System key x 1
Operation Voltage		DC +24V (-10% ~ +15%) (Please use isolated power supply) (Note 2)		
Backup Battery		3V lithium battery CR2032 x 1 / battery life: 5 years		
Buzzer		85dB		
Perpetual Calendar (RTC)		Built-in		
Cooling Method		Natural air circulation		
Safety Approval (Waterproof for front panel)		IP65 / NEMA4 / CE, UL		
Operation Temp.		0°C ~ 50°C		
Storage Temp.		-20°C ~ +60°C		
Ambient Humidity		10% ~ 90% RH [0 ~ 40°C], 10% ~ 55% RH [41 ~ 50°C] Pollution Degree 2		

MODEL	A(E)57CSTD	A80THTD1 AE80THTD	A(E)10THTD1
Vibration Resistance	IEC 61131-2 Compliant 5Hz≦f＜9Hz = Continuous: 1.75mm / Occasional: 3.5mm 9Hz≦f≦150Hz = Continuous: 0.5g / Occasional: 1.0g X, Y, Z directions for 10 times		
Dimensions (W) x (H) x (D) mm	184.1 x 144.1 x 47	243.1 x 178.1 x 52.4	297.1 x 222.1 x 51.1
Panel Cutout (W) x (H) mm	172.4 x 132.4	231.4 x 166.4	285.2 x 210.2
Weight	Approx. 760g	Approx. 1140g	Approx. 1735g

NOTE

1) The half-life of backlight is defined as original luminance being reduced by 50% when the maximum driving current is supplied to HMI. The life of LED backlight shown here is an estimated value under 25°C normal temperature and humidity conditions.
2) Users please use isolated power supply except DOP-A80THTD1, DOP-AE80THTD and DOP-A(E)10THTD1 these models.
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